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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,548	07/20/2004	Dureseti Chidambarrao	FIS920040178US1	4547

32074 7590 11/28/2006

INTERNATIONAL BUSINESS MACHINES CORPORATION
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BLDG. 300-482
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EXAMINER	
FULK, STEVEN J	

ART UNIT	PAPER NUMBER
2891	

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/710,548	CHIDAMBARRAO ET AL.	
	Examiner	Art Unit	
	Steven J. Fulk	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *1-8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group II, claims 9-20, in the reply filed on September 18, 2006 is acknowledged.

The traversal is on the ground(s) that the restriction vaguely stated that "the method as claimed can be used to make other and materially different product", but fails to list any such "other and materially different products" and thus both Groups I and II are one and the same. This is not found persuasive because the proper test for showing that a product and a method are restrictable has been satisfied. That is, Groups I and II are distinct if **EITHER** (1) the process as claimed can be used to make another and materially different product **OR** (2) the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). Groups I and II were shown to be distinct by Case (2), wherein the product as claimed can be made by a materially different method such as using compressive strain to increase mobility of electrons and tensile strain to increase the mobility of holes. Case (1) does not need to be shown for the restriction to be valid.

The traversal is also on the ground(s) that the species are not distinct because pairs of n-p-n and p-n-p devices are typically found on the same semiconductor substrate. This argument is not found persuasive because the Applicant has not claimed the combination of the species, only the individual species of an n-p-n transistor (claim 2) and a p-n-p transistor (claim 3). The accepted tests set forth in MPEP § 808.01(a) for establishing distinctness have been

satisfied, i.e. the species are independent or distinct because they have a materially different design and mode of operation.

The traversal is also on the ground(s) that the features and aspects of the claims are such that serious burden would not be placed on the Examiner to search the comment subject. This is not found persuasive because the accepted tests set forth in MPEP § 808.02 for establishing a prima facie case of burden have been satisfied, as such the burden has shifted to the applicant and the applicant has failed to rebut.

The requirement is still deemed proper and is therefore made **FINAL**.

Specification

2. The disclosure is objected to because of the following informalities: Line 4 of Paragraph 52 recites "The layer 4 deposits as...". The examiner believes this should read "The layer [420] deposits as...".

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the

reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 9-10, 12, 13, 16-18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 7,102,205. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 9-10, 12, 13, 16-18 of the instant application are anticipated by the limitations of claim 2 of U.S. Patent No. 7,102,205.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 9-11 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujimaki '725.

Fujimaki discloses a bipolar device comprising a collector region (fig. 2, NPN transistor, 105), a base film (fig. 4, 118b) disposed atop the collector region; an emitter structure (fig. 4, 122) formed atop the base layer; and a nitride stress film (fig. 4, 117) disposed adjacent the emitter structure and atop the base film; wherein the stress film is disposed in close proximity to an intrinsic portion of the device (p-n junctions form intrinsic regions); and wherein the emitter structure is "T-shaped" (122), having a lateral portion atop an upright portion, a bottom of the upright portion forms a contact to the base film, and the lateral portion overhangs the base film.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 12-13, 15 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimaki '725 in view of Ko et al. '470.

Fujimaki discloses all of the elements of the claims as set forth above, including forming a nitride stress film atop the base film, but the reference does not explicitly disclose the film to be a means to create compressive strain to increase the mobility of electrons in the device and a means to create tensile strain to increase the mobility of holes in the device, wherein the stress film has at least 0.5 GPa intrinsic stress. Ko et al. teaches a method of forming tensile and compressive stress using a silicon nitride layer (fig. 3g, 238/228) having at least 0.5 GPa stress (¶38) to improve carrier mobility in a transistor (¶43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the stress of the nitride layer of Fujimaki as taught by Ko et al. One would have been motivated to do this because Ko et al. taught that creating tensile and compressive stress in a transistor increased the carrier mobility in the device (¶43), thus improving the performance of the device.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ozkan et al. '369 and U'Ren et al. '256 disclose bipolar transistor structures with a collector region, a base film, and an emitter structure having a "T" shape atop the base film.

Craig et al. '549 and Huang et al. '405 disclose methods of improving carrier mobility in transistors using a silicon nitride stress film.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SJF

BRADLEY K. SMITH
PRIMARY EXAMINER

Steven J. Fulk
Patent Examiner
Art Unit 2891

November 22, 2006